Chapter I

THE COMMUNITY OF BANG CHAN

The Geographical Setting

In the populous flat central plain of Thailand where Bang Chan was located, fenceless geometric rice-fields, dotted by clumps of trees, stretch as far as the eye can see. Houses, clustering occasionally into hamlets, line the canals that serve for domestic use, drainage, irrigation, and communication. A few rounded-up roads lead out from Bangkok, the national capital on the Menam Chao Phraya, the great central river.

The monsoon divides the year into three seasons: a hot and wet (late May through November); a cool and dry (December to mid-February); and a hot and dry (late February to mid-May). The temperatures range annually from 59° to 88° F. (15° to 33° C.) with monthly means of 77° to 86° F. (25° to 30° C.) (de Young:5). A drop at night averages around 18° F. (10° C.) in April, and 22° F. (12° C.) in January, while the relative humidity varies between 66 per cent and 81 per cent (Hauck, et al.:12). Rainfall averages about 50 inches a year, 40 of which fall in the wet season (Janlekha:21). Because of the run-off from the mountains in the north, once a year the Menam Chao Phraya slowly rises, fills the canals and then overflows its banks, covering the plain for hundreds of miles to a depth of three feet or more. In Bang Chan, the water stood on the land from June until January, with its peak in October. From February to May the canals ran low, and the land dried and cracked from the intense heat.

The Community

In 1954, 1700 persons (336 families) lived in Bang Chan. Muslims, comprising 10 per cent of the population, lived as fully Thai citizens in all parts of the community in economic and social symbiosis with Buddhists. A few ethnic Chinese had married into Thai families and were accepted.

The community spread over an area of about 7000 rai (1000 hectares or 3 square miles). Bang Chan Canal bisected

361 Most of the dwellings in Bang Chan flanked the canals that stretched away from the temple area. All houses were in sight of one or more other houses, if not standing side by side. Here and there they formed small hamlets where kinsmen tended 351 to live in proximity. Around the houses were kitchen gardens and threshing floors, and behind them, the fields. Bananas grew 245 abundantly; pineapples, mangoes, and other fruits occasionally. The canals were full of water-vegetables, cultivated or wild, 241 while fish were plentiful. Water sources were the rain, kept 226 in large jars; artificial ponds dug near the houses and fed from ground water; and the canals. No wells existed. The large • 312 tile roofs of the temple collected a good deal of rain-water which was available to anyone during the hot season when all water ran low.

146 General Nutritional Level

[142] The population was physically well-formed with few physical deformities evident. There was little obesity or emaciation. The daily diet (cf. Hauck, et al.:passim) consisted of large quantities of rice, with small amounts of fish, meat, vegetables, fruits, spices, and eggs. Food at the not-infrequent festivals [292] was rich in meat, eggs, and sugar. No milk was available except canned imports, and little was used. "Nevertheless, though caloric deficiency ('hollow hunger') was not prominent, over half of a sample of the population inspected medically had one or more signs of malnutrition. Even in a group chosen for research reasons for apparently good nutrition, about one in four had some such sign and in another group, selected for evidence of poor nutrition, two out of three persons had such."[2] The nutritional level in Bang Chan did not always correlate absolutely with economic level, for nutritionally one of the poorest families was found to be one of the best fed because the father did so much fishing and collecting of green canal vegetables. The [178] change-over, some decades ago, from home pounding of rice to [256] steam milling by most families had probably been a major factor in increasing nutritional deficiencies throughout the community.

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2. Dr. H.M. Hauck, personal communication, 1959.

wood was getting low. Friday (wan suk:day of happiness) was the best day of all to leave the fire, but for her, Friday happened to fall on the fourteenth day after delivery. It was better to come off on another day than to risk taking such an important step on an even-numbered day. Even numbers were always associated with the even corners of a coffin. 846 [801]

Usually the fire period went off safely, but not this time! One day, the heat "seemed to come up suddenly" and choke Dūan. She rose gasping and ran to the window for air. Horrified at the terrible danger of cool air, Lek hastened to get her back to the board. Then by accident Dūan dripped too much water on the fire and put it out! Later, Dūan was almost unconscious, felt unhappy (klum) and as if "the fire were burning inside her." Lek called both Sāi and the mō. As the mō entered, Lek handed him the expected offering of incense, flowers, candle, and a baht and a half for his khwan khāe. He prayed to his teacher, then made holy water and a decoction both of which he gave Dūan to drink, saying, "The bad blood and the fish-water did not flow out well, a common trouble after childbirth. Since your body is not cold and the fire has not been out a half-day, you could start the fire up again. But as it is never good to put out the fire like this, I am taking you off it. Take a pot of salt, heat it well and wrap it in a cloth. Put that on your abdomen. Drink no cold water, or you will die." 846 755 846

Dūan was sad that she had to leave the fire early and on an even-numbered day, but one always wanted to obey a mō. All had gone so well when Chāi was born! That time she had taken the usual steps, choosing a Friday to come off the fire. Now she could not choose. Her formal leave of the fire was as before: The mō prepared earth holy water (nammon thoranisān), some of which she drank, and some he sprinkled on the fire. She then knelt down facing the fire and touched her forehead to the floor 3 times, asking the Mother of the Fire to bless her and her child, and to keep them well. She went outside to bathe, first with warm water to cleanse her body, then with holy water, and put on a clean skirt. Returning to the house she seated herself quietly, for she was not supposed to do anything for a time. Others in the family broke up the fireplace. The baby was taken off the winnowing tray. Warm water mixed with the holy water was dropped in his mouth. After being bathed in the holy water, he was laid in a little cradle made of a long cotton scarf, spread apart with sticks, and swung between 2 houseposts. [854]

Now that the fire-period was over, they stopped all boiling of the water for the baby and Dūan. Rain water was substituted, but whenever the baby seemed sickly, boiled water was used. When their rain-water ran out, they got some at the temple. Both Dūan and the baby continued taking medicine for many weeks. [312] [758]

251 which did not attract them could be left anywhere out of reach of dogs. Raw rice was stored in a large jar or oil can while salt, fermented fish, shrimp paste[1] and fishsoy[1] were kept in smaller jars or bottles. Such containers were customarily covered. Dried food materials such as onions, garlic, chili peppers and other seasonings were often kept in a basket hung from the roof. Paddy, i.e. unhusked rice, was kept in a large bin of matting or wood, the excess sometimes simply piled on an uncovered mat on the floor.

125 Descriptions of two kitchens, one in a relatively prosperous household and one in a poorer home in Bang Chan, are included in excerpts from field notes, Appendix A, p. 93.

312 In a few homes, a clay water jar was kept in the kitchen or nearby, but more frequently foods were washed, and cooking water obtained at the canal or fish pond.

The water level varied between heavy flood and threatened drought. There were no deep wells in the whole area. Rainwater was collected from the roofs and stored in jars, but during the dry season, the canal or fishpond, although low, must supply the needs of the household. In some, drinking water drawn from the fishpond was preferred, and an effort might be made to keep buffalo from wallowing in it, and to avoid contaminating it with fecal or food wastes or by bathing. Others considered the moving water of the canal preferable to pond water.

General Social Factors Affecting Nutritional Level

462 In Bang Chan, most farm and household tasks were shared by men and women. Both sexes plowed, planted, harvested and dealt with rice buyers; managed buffaloes, boats, and children; cooked, fished and cut wood for fuel; hired out as labor hands, "living in" if desired.

554 184 Though there were clear differences in socio-economic status, the daily life of the people was much alike: whether owners of land or renters, whether farming large or small acreages, the rich and the poor worked in the fields at the same tasks, produced or gathered much of their sustenance, and ran out of cash periodically. Socio-economic status was roughly defined in terms of food: a poor man "had one meal only to forego another;" a rich man "had or could get what he wanted to eat." (Sharp et al. 1953, p. 264.)

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1. Description of these products will be found on pp. 17-18.

Seasonal Activities

128 A chart has been prepared to show the climatic conditions in Bang Chan and what people were doing at different seasons (Chart 1). For convenience, the periods covered by the four rounds of the dietary survey (p. 58) are included.

29 The year starts with May, the beginning of the rice-
152 year. At this time the rains began to soften the parched
24 ground, and the heat slackened. School re-opened. Farmers
512 turned to plowing, harrowing, raising the seedlings. Both
87 sexes worked about equally in field labor, boys from 14 and
462 girls from about 15 years of age performing tasks according
93 to skill and strength. Everyone was in the field at dawn.
The buffalo, but not the farmer, rested through the noonday heat (about 10 a.m. until 2 p.m.) and also on the weekly holy
26 day. Meals were usually eaten about 10 a.m. and after returning from the field at dark. Although two meals a day were usual at other times, at this season, some had a third
120 meal about 2 p.m. If the buffalo were brought home to rest, this meal could be eaten at home, but hired laborers or those working far from home often took with them rice and other foods in a (2)pin-(1)too, or tiered lunch kit.

22 With the rains, the canals had filled, so that by June
132 buyers with big rice boats could return. The few farmers who
50 could afford to hold onto a portion of their last year's crop
44 sold it for a better price at this time. Vegetables and
24 fruits which had died in the long drought were replaced, and trees were planted.

24 In July the heavy transplanting season began. Because
22 of cooperative work habits or hiring out, people worked
13 solidly day after day for two months on their own or on another's fields. It was dawn-to-dark, back-breaking work.

This was an anxious time. The seedlings had to go in at exactly the right time. Water level was only partly con-
130 trollable. Lack of rain might be remedied by pumping water
87 from the canals but flooding would drown the plants. School
85 vacation was scheduled at this time so both teachers and
88 children could help. Older children might work in the fields, while younger ones, from 8 to 13, and the aged took over the care of babies and toddlers, fished, cooked, gathered food
43 for the family and grass for the buffalo. People knew the crop was subject to drought and flood, pests of rats and worms, destruction by birds or wandering buffalo or duck, and in the end to the mysterious fluctuations of the price of rice on the world market. Moreover, some persons worried about debts, acquired from giving a ceremony or making a capital investment and sometimes from heavy gambling during the rest season.

There was an important psychological difference between the two work seasons. At planting time, people were anxious; at harvest they were happy. People saw cash just ahead, for the crop was now safe. Each host of a cooperative work party gave at least one big convivial feast, the best he could provide and even the hired laborers got a round of liquor. People joked more than usual at work. Two boat loads of workers were observed racing down a canal at 6 a.m., shouting and cheering, although they had probably worked long hours for days or weeks before. Everyone knew that a joyous season was at hand.

When the crop was in, the people rested, fished, and began to prepare for big ceremonies demanding organized work. Supplies of fish were needed for preserving or for feasts. Labor and engines were now available, and with water low, fishponds could be conveniently drained, and the fish on the muddy bottom caught. A pond might be drained two or three times a year, but timing was determined by the availability of equipment and workers and by the needs of the annual ceremonial cycle. One pot of fish was given to each helper at a cooperative pond-draining.

Most farmers sold their rice in February. Capital was invested in farm equipment, buffalo, housing and ceremonies. Debts were cleared if possible. Cash expenditures for food, which had declined progressively since the beginning of the rice year, reached the yearly minimum, mostly because people had ample time to fish. People also saved up their money if they were sponsoring a ceremony, ate lightly at home if they were going to one. Since school closed from March 15 to May 1, because of the heat, money was not given to children for snacks.

The land dried up and cracked, rainwater for drinking gave out, and some canals were reduced to mud. Cherished plants were kept alive by watering, but no new planting could be done. Buffalo, which at other seasons were confined and fed, now roamed the fields, nibbling stubble. Everyone was busy and happy. Ordinations, weddings, cremations, merit-making feasts and several big holidays came one after another. Of the four New Year's Days observed in Bang Chan, the Buddhist New Year, which because of the lunar calendar fell about mid-April, was the most important, being celebrated over two days with extensive offerings of food to the priests and with other activities. The official New Year's Day, January 1, and the traditional New Year's Day about November 1, had rather slight observances. Chinese New Year's, in February, was celebrated by the Chinese residents who presented a school teacher and their hamlet headmen each with a boiled chicken and a Chinese sweet. Lent officially closed the ceremonial season, but the advent of plowing-time slowed the pace considerably.

When the rains finally came, the rice year started again.

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Chart 2. (continued)

	No.[1] Records	May	June	July	Aug.[2]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.[2]	Apr.[2]
Fruits[6]													
Banana[7]	129	x	x	x	x	x	x	x	x	x	x	x	x
Chico	17						x	x					
*Guava	14						x	x		x			
*Jujube	18							x	x	x			
Longan	41			x									
*Limes		x	x	x		x	x	x		x			
*Mango	25		x								x		x
*Orange	48					x	x	x	x				
*Papaya	11			x		x	x	x		x			
*Pineapple	63	x	x	x						x	x		
Rambai	46	x		x								x	
Sandorica	18	x	x										
Singharanut	22						x	x	x	x			
*Star gooseberry	28	x				x					x		
Source of water[8]													
For drinking:													
Rain		x	x	x	x	x	x	x	x	x	x	x	x
Canal										x	x	x	x
Fishpond		x	x									x	x
For food preparation:													
Canal		x	x	x	x	x	x	x	x	x	x	x	x
Fishpond		x										x	x

6. Good sources of ascorbic acid have been marked with an asterisk.

7. Bananas of the (4)nam-(4)wa variety were most commonly used.

8. Data for households participating in the dietary study.

2: Hauck et al. D.E-8 (1952-1954) 1958 AO7 Central Thai AO7 Bang Chan

might provide clues to ways in which the diet may be improved. Most of these items were included in lists given by Sharp et al. (1953)[1]. To those lists should be added the following items from our food records:

Green leafy and yellow vegetables: Leaves of bergamot, chili, morinda, onion, potato, pumpkin, (2)sa-(5)noo, and of the following trees: (2)ma-(1)dan, (4)khlyb[2] and West Indian pea tree; (2)kha-(1)cauaum flowers.

Other vegetables: flowers of leek and pumpkin, and Chinese or black truffle (water chestnut).

Fruits: Thai nutmeg and tomato.

Fresh foods other than fish: buffalo, duck, cobra, turtle and field rat.

At the end of Chart 2, sources of water for drinking and food preparation have been included, not only because water is properly considered a nutrient, but also because the water used in preparation of food may affect the wholesomeness of foods eaten raw or with little cooking.

Untreated water was the customary beverage with meals. Ordinarily no distinction was made in source of drinking water for children and adults although boiled water was given to mothers and infants to drink during the post partum rest period (Hauck, 1956). Occasionally a sick person would be given boiled water to drink; for example one man who said he was "a little sick" and "not working" was observed to drink hot boiled water from a thermos bottle. In 1955, Ralis[3] found that tea was seldom or never drunk by nearly 3/4 of the respondents. Less than 7% drank it frequently. Thus in Bang Chan no custom had grown up which would afford the general population with a measure of protection against infection from

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1. See Sharp et al., 1953, pp. 193-196 for a list of 32 fish known to be found in Bang Chan; pp. 293-294 for 34 fruits grown in Bang Chan, and p. 295 for 11 fruits known to be used but not grown there; pp. 296-298 for 41 vegetables grown in Bang Chan, and pp. 299-300 for 24 other vegetables used.

2. (4)Khlyb was the term used in Bang Chan for an unidentified tree of the family Leguminosae. Its sweet tasting leaves were washed in boiling water to get rid of a bad odor, then were eaten with (4)nam (4)phrig, a chili sauce.

3. Golden and Ralis, 1957, p. 57. The answers to: "Do you drink tea frequently, occasionally, seldom or never?" were: often, 22; occasionally, 68; seldom, 158; never, 85.

[176] higher calorie intake in these periods. In general, the
[22] level of calories, phosphorus and thiamine and to some extent the protein varied with the rice consumption. The greater consumption of fish when fish ponds were drained during Round IV, accounted for the relatively higher protein content of the diets of both groups at this time, even though calorie intake was not at its peak. During this period, animal foods provided 45 and 53% of the total protein intake of Groups A and B respectively, whereas for the year as a whole, 37 and 40% of the protein intake of these groups was of animal origin.

The relatively high vitamin A and C intakes of families in Group A, during Round I as compared to other periods, was associated with a higher consumption of green leafy vegetables, and the use of sweet potatoes in quantity by one family. During Round II, families in Group A had few green vegetables, and their average intake of vitamin A was very low. The use of papaya, obtained as a gift, by one family in Group B during Round II raised the average ascorbic acid intake for this group substantially. Better average intakes, by one or both groups, of vitamin A, thiamine, riboflavin and calcium during the first Round, were not such as to provide liberal body stores to be called upon when food supplies of these nutrients were low.

SOME RECOMMENDATIONS FOR IMPROVEMENT OF DIET AND NUTRITURE AMONG RESIDENTS OF BANG CHAN

[164] Attempts to improve nutritional status in Bang Chan should be directed both toward increasing the supply and intake of certain nutrients and toward improvement of sanitary conditions so that intestinal infestation, diarrhea and other related illnesses will not lead to needless loss or increased requirement of nutrients.

Solution of the related problems of disposal of human excreta and provision of a year-round safe water supply are in the province of the sanitary engineer. Intestinal parasitism was common, but little can be done through treatment [164] [312] of individuals so long as the water supply is contaminated. [271] Rain water was preferred for drinking, so provision of adequate and sanitary storage for rain water, coupled with sterilization of water from ponds and canals when rain water is not available, would do much to ensure safe drinking [846] water. The custom of giving mother and infant boiled water [353] only, during the post-partum rest period, provides a starting point for extending use of boiled water to other ages and conditions.

353 fish and vegetables, when asked if they did anything to stimulate milk secretion. Other preparations, each mentioned once or twice, were cobra curry, fried (3)ยอด (1)chaaj flower, pork soup with (3)ยอด (1)chaaj leaves, dried peas and peppers cooked in palm sugar syrup. Some of the medications used were reputed to stimulate milk flow. Three women spoke of peacock brand medicine and one of a Chinese medicine in this connection. With respect to the Chinese medicine, another informant said she took it "to remove the serum which interferes with milk secretion." One midwife put herbs on her daughter's breast and expressed and discarded the "early milk" which was considered bad for the baby. No association appeared to be made between putting the baby to the breast and stimulation of milk flow.

p 8% Drinking water. - Information concerning sources of drinking
• 312 water used by the mothers was obtained from 48 mothers of young babies. Of these, 20 used canal water, 23 rain water, and 3 used either one. In general, there was a relation between season and source of water used. Most of the mothers whose babies were born between March and October drank rain water, whereas from November to February a majority drank canal water. Some families had enough water jars to preserve rain water for much of the dry season, whereas others had few or no jars and, therefore, could save only small amounts of rain water on a day-to-day basis. In all instances, the water, whatever its source, was boiled for the mother during the postpartum rest period. Forty-six women said they drank the water hot; one said it was warm. One popular traditional midwife said, however, that if the mother had her baby in the hospital, use of boiled water for drinking and bathing was not necessary.

CONDITION AND CARE OF BABIES AT BIRTH AND IN EARLY INFANCY

125 All information to be reported concerning condition and care of babies at birth and in early infancy relates to infants who were under one year of age when first visited. Thirty infants were seen when they were under 3 months of age.

Condition at Birth.

164 The condition of the baby at birth was generally described
165 as satisfactory. One infant who died on the third day, before we saw the mother, was said to have cyanosis, failed to cry at birth, and needed to be "helped" for about one-half hour afterward. Three infants had congenital defects: umbilical hernia, inguinal hernia on the right side, and hemangioma on the right groin.

854 medications were taken internally, sometimes being painted on
278 the tongue with a feather; but two preparations were applied over the abdomen. Some of the medications were described as "stomach medicine" or "to prevent flatulence." Five different kinds of proprietary medicine were given to 18 infants. In 13 instances, the medicine given was clearly homemade and included as major ingredients items such as flattery fruit, (3)lung (1)yauau; cobra oil; horseshoe crab; and buffalo skin. The nature of the medicine, whether homemade or proprietary, was not clear in 8 instances. Usually medicine for infants was mixed with honey, but in 2 cases, alcoholic liquor was used as it customarily was for the mother.

Six newborn infants in this series were given no medicine. One of these was born at the Health Center. One of the other 2 infants delivered at the Health Center was given homemade medicine later, and no information was obtained on the third. Eye prophylaxis[1] was probably routine at the Health Center, as, in 2 of the 3 cases delivered there, informants knew that drops had been put in the infant's eyes. Traditional midwives, however, did nothing of this sort.

Water for Drinking and Bathing.

853 6 For the newborn infant as well as for the mother, water for
312 drinking and bathing was boiled and was usually used while hot, often being kept warm in a vacuum bottle. Either rain water or canal water might be used depending on what was available at a given season. The water was dribbled from an adult's fingers into the infant's mouth. When the mother was no longer lying by the fire, boiled water was not considered essential for the infant. Nevertheless, over half the infants [illegible]ases from this time up to 3 months of age were being given boiled water to drink. After 6 months of age this was rare.

853 In one instance, during the time when a younger sibling
855 received boiled canal water, a 21-month old child was given
312 boiled water also. At the time of a later visit both of these children were drinking unboiled canal water. In another case an orphaned boy's formula was made up with boiled water, although

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[744] [754] [781] 1. Vaccination for smallpox was the only modern preventive treatment which we knew to be used in Bang Chan in the absence of an epidemic. Since a severe epidemic of smallpox with many deaths ten years previously, health officers came to the Bang Chan elementary school once a year to vaccinate children, and other residents of the community could be vaccinated at this time. Four of the young children whom we visited periodically were vaccinated, at 4 months, 8 months, 1 and 2 years of age, respectively.

he was given untreated canal water to drink. One young mother gave boiled water to her 15-month old infant for a few days when the baby had diarrhea though on questioning she said no one had told her to do this. (The fact that boiled water was used for newborn infants and their mothers may have suggested the procedure to her.) Among the infants who received boiled water for a longer time than most, 4 were children of school teachers.

Early Feeding Practices.

Breast feeding was usual in Bang Chan, but most babies were not put to the breast until the second or third day or even later (Table 1).

Table 1. INITIATION OF BREAST FEEDING BY THE MOTHER FOR 38 INFANTS IN BANG CHAN.

Post natal day	Number of infants
1	1
2	11
3	22
4	2
5	2

As previously noted, no association was apparently made between putting the baby to the breast and establishing the milk flow.

In this series, 9 infants were nursed by a relative or neighbor one or more times before the mother's milk supply was established. Five of these infants had breast milk on the first day, 2 on the second, and 2 on the third. Choice of a woman who was a good milk producer to give the infant its first milk feeding was considered auspicious. The procedure was primarily of ritual significance.

Three infants were given cow's milk (diluted, condensed, or dried milk) before being put to the breast.

About half the infants received no food other than boiled water and milk while the mother lay by the fire. Honey was given with boiled water to about one-third of the infants, and about one-fourth had crushed banana, sometimes in addition to honey. When given, these foods were started before breast feeding was established. Either raw or baked, a small, rather flavorless variety of banana, (3)kluaj (4)nam-(4)wa, was used. We observed a grandmother dipping her fingers into a bowl of water, then crushing a bit of banana between them and poking this into the infant's mouth. The infant was given as much as he would take, usually about half of a banana at one time. Banana might be fed from one to three times per day.

desirable changes in Bang Chan. An important point, however, is that leaders should understand, insofar as possible, the reasons behind the "modern" ways and not accept them merely because they are considered modern. Without adequate understanding traditional behavior which has served a useful purpose in protecting the people's health might be abandoned, or a half-understood "modern" way substituted to their hazard. For example, a popular traditional midwife said she knew that water was not boiled for mothers and babies in the hospitals in Bangkok, and the wife of a school teacher said she did not think use of boiled water was really necessary during (2)juu (1)faj. Traditionally, heat has been considered beneficial at this time. If this idea were extended to include an understanding of the value of boiling water to destroy harmful microorganisms and parasites, the traditional practice might be confirmed and even extended for the protection of other family members. If a sanitary water supply eventually becomes available in Bang Chan[1], precautions required to keep it so might be thought of as analogous to boiling of water; or chemical purification might be understood by the peasant as a modern way of conferring on water the virtues which boiling conferred when the "old way" was followed. Improvement in health and nutrition in Bang Chan must, of course, be seen as a long-time goal dependent on continuing education.

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[312] 1. In 1952-54 there were no wells in the area, and the problem of planning for a sanitary water supply when the plain is flooded for a part of each year is not an easy one.

251 One family stored cooked food in a basket which was hung from the ceiling. One homemaker frequently covered such foods with a basket, and in one instance a homemaker, who usually took no precautions to protect cooked foods, used a basin to cover food left on a table.

271 Source and Treatment of Water For Drinking and Culinary
• 312 Purposes. - From the time the dietary survey was begun, on May 26, 1953, through January 18, 1954, all families used rain water for drinking.

Of the 14 survey days, spaced at about weekly intervals, between January 28, 1954 through May 8, 1954, canal water was used for drinking on 7 days, water from fish ponds on 4, and rain water on 3 days. No distinction was made in source of drinking water for children and adults.

312 All families used canal water for washing vegetables,
744 cooking, and washing dishes, on the survey days from May 26, 1953 through March 18, 1954. On the 6 survey days between March 24 and May 8, 1954, 4 families used water from the fish pond for these purposes. In no instance was the water treated
[846] in any way before being used, although alum is known to be used, at times, in the village, to settle or clear water, and boiled water is given mothers and infants to drink during the post partum rest period.

514 Disposal of Excreta. - Of 30 families from whom information was obtained, 20 had pits for toilet use, only one of which was equipped with a cover. One other family had a flush latrine. Of the 8 families who had no special place which was used for toilet purposes, 4 reported that family members urinated on the compound, 3 that they used the fields, and 1 that either compound or field might be used for urination. One reported that the compound was used for defecation as well as urination; the remaining 7 said they went to the field to defecate.

Six families with pit latrines covered feces in some way: 3 used earth, 2 ashes, and 1 either earth or ash. A majority of those who used either an uncovered pit or had no designated place, reported that no attempt was made to cover feces. From six families, no information was obtained on this point. Various materials were mentioned as being used in the manner in which western peoples use toilet paper. Cocoanut husks were mentioned most frequently (25 times), and other materials in this order: paper (newspaper 9 times, straw paper once), wood (4 times) and water (3 times).

From the information available, custom and convenience rather than sanitary considerations appear to determine practices that are followed. If improved practices are

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

CHAPTER II

THE COMMUNITY

Geography

131 The community of Bangchan is situated some twenty road-miles northeast of Bangkok in the heart of the economically all-important commercial rice growing area of central 361 Thailand. Surrounded by their rice fields, the population [161] of about 1,600 persons lives on some three hundred small [503] family homesteads scattered along a half dozen connecting *[243] canals. The community occupies an area of 6,500 rai,[1] or 2,600 acres, all of which, with the exception of about 300 rai of homesites and narrow strips bordering canals, is given over to the production of wet rice.

134 The soil of Bangchan area is heavy dark clay with *243 an impervious layer at a depth of about six to eight inches and is suited only to rice growing.

133 The area is essentially flat, rising slightly toward • 312 the north. It receives, in addition to rain water, irrigation water channeled into it through the Saen-saeb Canal one mile to the south, Samwa Canal one mile to the east, and Khlong-song Canal one mile to the north.[2]

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[804] 1. One rai is equal to two-fifths of an acre.

2. See map on page 162.

7: Janlekha X-4,5 (1948-1953)1956 AO7 Central Thai AO7
Bangchan

132 The monsoon climate of the region in which the village lies gives the area an annual rainfall, averaged over a recent ten year period, of about fifty inches; the effective rainfall, for the critical months when the rice is in the ground, is about forty inches.[3] The minimum precipitation requirement for wet rice is about seventy inches a year. This rainfall deficiency in the central plain of Thailand is made up by direct flooding from the rivers which flow in from the mountains and plateaux on the northeast, north, and west, the run-off rate fortunately being low because forests still cover much of these uplands. The whole plain is channeled for simple distribution of the spate of these rivers which occurs during October, November, and December, just before the harvest of rice. Because most fields are fed by gravity without an artificial head of water, or with only small heads impounded behind water gates, the depth and duration of flooding cannot be wholly controlled. As a result, variable water supply produces a wide variability in harvests and crop risks may be considerable. For 117 years between 1831 and 1948 the ministry of Agriculture records four major damaging floods (1831, 1879, 1917, and 1942), four years of extreme drought, thirty-five years of severe drought, and twenty-one years of moderate drought, leaving only fifty-three years of optimal supply of water.[4]

3. Central Service of Statistics, Statistical Yearbook of Thailand, No. 21, 1939-40-1944. Bangkok, 1950.

4. Ministry of Agriculture, Thailand and Her Agricultural Problems (Bangkok, 1950).